



A) COURSE

Course Id:	Course
5503	Manufacturing proceses I

Class Hours per Week	Lab hours per week	Complementary practices	Credits	Total hour course
4	2	4	10	64

B) GENERAL COURSE INFORMATION:

	EE (IEA)	ME (IM)	MME (IMA)	EME (IME)	MTE (IMT)
Level:				VIII	VII
Course Type (Required/Elective)				Required	Required
Prerequisite Course:				180 credits	Materials for Engineering
CACEI Classification:				AE	AE

C) COURSE OBJECTIVE

At the end of the course, the student will be capable of:

Identify and analyze the principle of operation of each manufacturing process and its implementation , as well as machine tools know each process and to acquire an overview of the wide range of possibilities concerning the existence of tools and materials for manufacturing

D) TOPICS (CONTENTS AND METHODOLOGY)

1.- Overview of the manufacturing techniques (metals).		16 hours
Specific Objective:	The student will know in general the different manufacturing techniques that exist actually as well as the different classifications of these processes to shape metallic materials.	
1.1 Manufacturing definition. 1.2 Classification of manufacturing processes. 1.3 Classification of basic industries. 1.4 Trends in manufacturing. 1.5 Clasification of materials.		
Readings and other resources	Bibliography basic of reference	
Teaching Methodologies	Exhibition topics. Questioning students about the topic. Investigation works.	



Learning Activities	Visit companies. Class participation.
----------------------------	--

2.-Creation of the form.	16 hours
--------------------------	-----------------

Specific Objective:	The students identify and describe the different techniques manufacturing of parts from mold with sand and other materials as well as the manufacture of metal parts from metal powders, analyzing the advantages of each method.
----------------------------	---

2.1 Creation of the form by casting.
 2.1.1.Overview.
 2.1.3 Models and molds.
 Methods 2.1.4 of the Technical manufacturing of molds and cast.
 2.1.5 Guidance for shaping parts.
 2.1.6 Failures caused by poor design casting.
 2.1.7 Preparation and treatment of castings.
 2.1.8 Casting materials and their properties.
 2.2.Powder Metallurgy.
 2.2.1 Fundamentals.
 2.2.2 Technology and powder manufacturing.
 2.2.3 Classification and properties of powders.
 2.2.4 forming processes parts.
 2.2.5.Sintering and calibrated.
 2.2.6 Applications.
 2.2.7 Guidelines for the design of parts.
 2.3 Special methods for creating form.
 2.3.1 Galvanic Training.

Readings and other resources	Basic bibliography reference.
-------------------------------------	-------------------------------

Teaching Methodologies	Exhibition topics. Questioning students about the subject. Investigation work
-------------------------------	---

Learning Activities	Visiting companies. Class participation.
----------------------------	---

3. Modeling.	16 hours
--------------	-----------------

Specific Objective:	The student identify and describe the different techniques of metal shaped by application of external forces and material removal also analyze the application and advantages that each of these methods.
----------------------------	---



<p>3.1 Introduction.</p> <p>3.2 Fundamentals of modeling techniques.</p> <p>3.2.1 Metallurgical Fundamentals.</p> <p>3.2.2 Fundamentals of the theory of plasticity.</p> <p>3.2.3 Solution methods in the mechanical of plasticity.</p> <p>3.2.4 Friction and lubrication.</p> <p>3.2.5 Transformation of the surfaces.</p> <p>3.3 Technology.</p> <p>3.3.1 Massive modeling (stressed, forged, rolling, drawing, wire drawing, sausage, extruded, punching, stamping, rolling, nodded off).</p> <p>3.3.2 Modeling sheet Sheet modeling (bending, deep drawing, bulging, printing and embossing).</p> <p>3.3.3 modeling under special conditions.</p> <p>3.4 Machine tools for modeling.</p> <p>3.4.1 Features of the machine tools.</p> <p>3.4.2 Fixed path presses. Mechanical type.</p> <p>3.4.3 Fixed force presses. Hydraulic type.</p> <p>3.4.4 Steady job presses. Hammers type3.4.5 Work Safety.</p> <p>3.4.5Job security.</p> <p>3.4.6 Automation.</p>	
Readings and other resources	Basic bibliography reference.
Teaching Methodologies	Exhibition topics. Questioning students about the subject. Investigation work
Learning activities	Visiting companies. Class participation.

4.-Cutting.		16 hours
Specific Objective:	The student identify and describe the different methods, technologies and foundations involved in a cutting operation, as well as the application and advantages of each of these methods.	



4.1 Generalities. 4.2 Cutting and shearing. 4.2.1 Classification. 4.2.2 Technology. 4.2.3 Forces y work. 4.2.4 Manufactured parts properties. 4.2.5 Tools. 4.2.6 Special cutting methods. 4.3 Cutting with edge defined tools. 4.3.1 Fundamentals. 4.3.2 Turning. 4.3.3. Brushing. 4.3.4 Drilling. 4.3.5 Milling. 4.3.6 Broaching. 4.3.7 Cutting forces. 4.3.8 Directive values in the cutting with edge defined tools. 4.4 Cutting with undefined edge tools. 4.4.1 Fundamentals. 4.4.2 Rectified and grinding. 4.4.3 Burnish. 4.4.4 Lapping. 4.4.5 Special methods.	
Readings and other resources	Basic bibliography reference.
Teaching Methodologies	Exhibition topics. Questioning students about the subject. Investigation work
Learning Activities	Visiting companies. Class participation.

E) TEACHING AND LEARNING METHODOLOGIES

- a) Exposure of topics.
- b) Questioning students about the subject.
- c) Research.
- d) Visiting companies.
- e) Participation in class.

F) EVALUATION CRITERIA:

Evaluation:	Schedule	Suggested Form of Evaluation and weighing	Topics
1st. Partial Evaluation	15 Sessions	Exam 80%, Tasks 20%	1
2nd Partial Evaluation	15 Sessions	Exam 80%, Tasks 20%	2
3rd. Partial Evaluation	15 Sessions	Exam 80%, Tasks 20	3
Final Ordinary Evaluation	15 Sessions	100% (Average of the Partial Evaluations)	4
Other activities:		Exam 80%, Tasks 20%; (Valor relativo: 33.3%)	
Extraordinary Exam			



Title Exam	Week 17 of the semester in course	Exam 100%	Topics 100%
Regularization Exam	According to the program of the School Secretary.	Exam 100%	Topics 100%

G) BIBLIOGRAPHY AND ELECTRONIC RESOURCES

Main Books

1. FUNDAMENTOS DE MANUFACTURA MODERNA (MATERIALES, PROCESOS Y SISTEMAS), MIKELL P. GROOVER, EDITORIAL MC GRAW HILL, 2007.
2. PROCESOS DE MANUFACTURA VERSIÓN SI, MYRON L. BEGEMAN EDITORIAL CECSA, 2003.

Complementary Books

1. PROCESOS Y MATERIALES DE MANUFACTURA PARA INGENIEROS, LAURENCE E. DOYLE, CARL A. KEYSER, LAMES L. LEACH. EDITORIAL PRENTICE HALL.
2. MANUAL DE INGENIERO MECÁNICO, DUBBEL W. BEITZ, K. H. KÜTTNER, EDITORIAL SPRINGER-VERLANG.
3. CATALOGOS:
 - LEÓN WELL, S.A. DE C.V.,
 - KENNAMETAL INC,
 - MITUTOYO MEXICANA S.A. DE C.V.
 - SERVIACERO ESPECIALES S.A. DE C.V.
 - SANDVIK COROMANT, PRODUCTOS PARA EL MECANIZADO DEL METAL.
 - DORT, FABRICACIÓN DE PIEZAS POR MEDIO DE METALURGIA DE POLVOS.

Internet Links

- www.iscar.com Herramental para maquinas de herramientas fijas y rotativas.
www.kennametal.com herramental para maquinas herramientas, fijas y rotatorias.